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NEW MAMMAL RECORD FOR FREMONT ISLAND WITH AN UPDATED CHECKLIST OF MAMMALS ON ISLANDS IN THE GREAT SALT LAKE

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Islands of the Great Salt Lake were first visited by Europeans when a party led by Fremont (1850) landed on Fremont Island in the northeast arm of the lake. Fremont named the island "Disappointment Island" due to its lack of fresh water and timber, although the island is somewhat of a disappointment to a mammalogist as well, with only three species of mammals recorded. Deer mice (*Peromyscus maniculatus*), jackrabbit (*Lepus californicus*), and ground squirrel (probably *Spermophilus townsendii*) have been found on the third largest island (approximately 1300 ha) in the lake (Goldman 1939, Marshall 1940). Goldman (1939) ascribed subspecific status (*P. m. inclarus*) to deer mice from Fremont Island based on pelage differences from the mainland *P. m. sonoriensis.* One specimen of jackrabbit was taken by Marshall (1940), who reported that, in addition to being recent immigrants, they were also scarce. According to sheepherders on the island, rabbits may have crossed in the winter over ice and debris from Bear River during winter of 1933–34. The ground squirrel was a single specimen observed by Stansbury (Marshall 1940), who considered it an anomaly.

Surveys of the islands in 1937 and 1938 (Goldman 1939, Marshall 1940) were performed during a historic low in lake levels, when many islands were actually peninsulas connected to the mainland by sandbars. However, Fremont is one of the few Great Salt Lake islands that has been nearly continuously isolated from the mainland during the historic record and probably into the evolutionary past (Arnow and Stephens 1990). Marshall (1940) reported that the island had been connected with the mainland by a sandbar 20 miles to the eastern shore of the lake for 3 years since 1850 (the beginning of lake-level records) when lake levels were near 4194 feet. Since 1938, lake levels were continuously below 4195 feet from 1959 to 1971, possibly providing periodic connections over mudflats with the mainland at that time (Arnow and Stephens 1990).

Since the 1938 census, publications concerning the Great Salt Lake islands' fauna have been limited to literature reviews (Rawley et al. 1974, Gwynn 1980), with no new sampling efforts reported until recently. However, even brief studies on islands other than Fremont have revealed substantial changes in their species lists since those compiled by Bowers (1982), who relied primarily on the 1938 census. Marti (1986), in a study of Barn Owl diets on Antelope Island, recorded six new mammal species for that island, including a shrew, two voles, and two rather common Great Basin species, the Great Basin pocket mouse (*Perognathus parvus*) and the western harvest mouse (*Reithrodontomys megalotis*). Paul (1983) reported that badger and fox occur on Antelope island. Cramer et al. (1990) also reported dramatic changes in species composition of mammals on Dolphin Island. Given the recent additions of common species to some islands' species lists (Table 1), the relatively low trapping effort of the 1938 census (e.g., only 37 trap nights on Dolphin Island), and the unusually impoverished fauna recorded for Fremont Island, I spent 3 days and 2 nights (20–23 June 1992) trapping on Fremont Island to determine whether known mammal records

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TABLE 1. Current records of species by island for mammals in the Great Salt Lake. Key: 1–Goldman (1939), Marshall (1940), Durrant (1952); 2–Cramer et al. (1990); 3–Marti (1986); 4–Paul (1983); 5–present study.

Species	Island						
	Bird	Dolphin	Gunnison	Carrington	Fremont	Stansbury	Antelope
Sorex sp.							3
Dipodomys microps		1	1	1		1	
Dipodomys ordii	1	2		1		1	1
Perognathus parvus				1		1	3
Perognathus longimembris		2					
Thomomys bottae						1	1
Eutamias minimus						1	
Spermophilus townsendii					1	1	1
Erethizon dorsatum		1				1	
Peromyscus crinitus						1	
Peromyscus maniculatus	1	1	1	1	1	1	1
Reithrodontomys megalotis					5	1	3
Neotoma lepida		1		1		1	1
Onychomys leucogaster						1	
Ondatra zibethicus							3
Microtus montanus							3
Microtus pennsylvanicus							3
Sylvilagus nuttalli				1		1	1
Lepus californicus					1	1	1
Odocoileus hemionus						1	1
Antilocapra americana							1
Lynx rufus						1	1
Mustela frenata							1
Taxidea taxus						1	4
Mephitis mephitis						1	1
Vulpes vulpes							4
Canis latrans	1	1		1		1	1
Maximum species recorded	3	7	2	7	4	19	21
Most recent # species	3	2	2	7	2	19	21
Total island area (ha)	9	21	67	730	1217	7977	10,767

could be scarce due to inadequate sampling effort. In a short sampling period, I anticipated the possibility of catching common Great Basin species such as heteromyids (whose unusual absence was commented on by Marshall [1940]) and verifying anecdotal reports of ground squirrels and jackrabbits on the island.

On the first night of trapping, I set out 160 Sherman live-traps in three localities on the island. Ninety traps were set near Beacon Hill by the north shore of the island. Thirty were set near the north shore north of Castle Rock, and the remaining 40 were set in more diverse habitat at higher elevations (1450–1500 m) just below Castle Rock on its north-facing slope. Twenty-four deer mice (*Peromyscus maniculatus*) were captured on these three areas. Those traps were left in place for a second night, and an additional 60 traps were set near the southeast point of the island in an area with very sandy soils. The following morning 40 deer mice and one western harvest mouse (*Reithrodontomys megalotis*) were collected. Total trapping success was 17%, but was twice as high (30%) at the high-altitude location near Castle Rock compared to other locations (G-test, $G = 9.71$, $P < .005$). I suspect the high capture rate was due to the habitat, which had more shrub cover (much of the island is monospecific stands of cheatgrass, *Bromus tectorum*) and broken, rocky terrain that could provide ample shelter and nest sites.

Thirty-six percent of the deer mice captured were juveniles, and the sex ratio was slightly biased toward males (56%). The single harvest mouse collected was an adult scrotal male and the first harvest mouse recorded on the island. The specimen was deposited as a skin and skeleton in the Utah Museum of Natural History at the University of Utah (catalog #29260).

No other small mammals were captured, nor was any evidence of their presence on the island recorded. I surveyed the island for evidence

of mammals previously recorded there, including black-tailed jackrabbits and Townsend ground squirrels. Jackrabbits reported on the island in 1938 clearly did not persist. The complete absence of rabbit fecal pellets was particularly convincing evidence of the absence of rabbits on this island, although the remains of one were found near a Golden Eagle (*Aquila chrysaetos*) nest. The lone ground squirrel recorded by Stansbury was obviously not part of a viable island population. I saw no ground squirrels nor any evidence of burrows or runways. Other small mammals common to the area such as desert woodrats (*Neotoma lepida*), pocket mice (*Perognathus* sp.), and kangaroo rats (*Dipodomys* sp.) are also conspicuously absent from Fremont Island. I saw no evidence of heteromyid burrows, particularly in apparently suitable habitat on the southeast corner of the island. Rocky crevices, normally common nest sites for desert woodrats, were completely unused; I found no nests or fecal material.

Clearly, Fremont Island is truly depauperate in mammalian fauna. Apparently, deer mice and western harvest mice are the only native mammals on the island, and many species common to the adjacent mainland are absent. The island is much larger than Carrington Island, which supports six species of mammals. Similarly, Gunnison, Bird, and Dolphin islands all support two species of mammals on much smaller areas. It is tempting to suggest that the more isolated nature of Fremont Island and probable lack of frequent immigration have led to its simple mammalian fauna. Habitat area and diversity may also be factors affecting successful colonization since much of the island's original bunchgrass and shrub cover has been reduced by fire, grazing, and cheatgrass invasion.

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